

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
3 February 2005 (03.02.2005)

PCT

(10) International Publication Number
WO 2005/009677 A1

(51) International Patent Classification⁷: **B23Q 3/155**,
3/157, B23B 31/26

[KR/KR]; 910-208 Jukong Apartment, Kojan 2-dong,
Ansan-si, Kyungki-do 425-726 (KR).

(21) International Application Number:
PCT/KR2004/000293

(74) Agent: **KIM, Kook Nam**; 2nd Fl. Shindo Building,
823-10, Yeoksam-dong, Kangnam-ku, Seoul 135-080
(KR).

(22) International Filing Date: 13 February 2004 (13.02.2004)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
10-2003-0051881 28 July 2003 (28.07.2003) KR

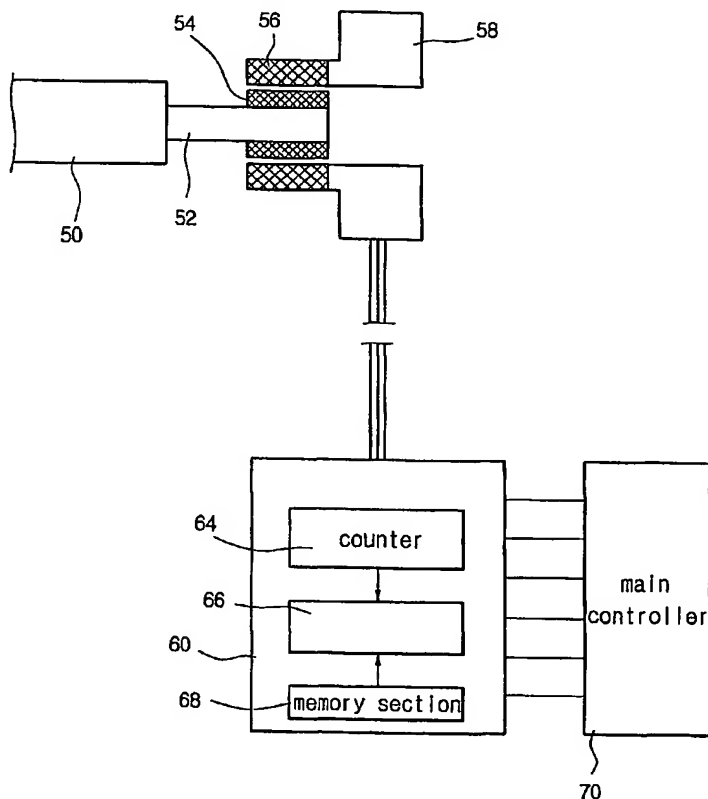
(71) Applicant (for all designated States except US): **YIWON
ENGINEERING INC.** [KR/KR]; 2 Na 201, Sihwag-
ongdan, 1260 Jungwang-dong, Siheung-si, Kyungki-do
429-450 (KR).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,

[Continued on next page]

(54) Title: APPARATUS FOR DETECTING POSITION OF DRAWBAR IN AUTOMATIC TOOL CHANGE DEVICE



(57) Abstract: Disclosed is an apparatus for detecting a position of a drawbar unit installed in a spindle unit. The apparatus is a part of an automatic tool exchange device for exchanging tools in the spindle unit of a machine tool. The apparatus transmits a signal to a main controller after detecting the position of the drawbar such that the main controller checks a state of a tool clamped by the drawbar unit. The drawbar unit is installed in the spindle unit forming the automatic tool exchange device and clamps the tool at a front thereof. A core is installed at a rear peripheral portion of the drawbar unit and a coil section having a cylindrical shape is wound around an outer peripheral portion of the core. An LC oscillating circuit is provided such that the LC oscillating circuit includes the coil section as a part thereof. An oscillating frequency of the LC oscillating circuit varies depending on a position of the core made of magnetic material, so the apparatus detects the position of the drawbar unit based on the oscillating frequency of the LC oscillating circuit. A position detecting section transmits present position information of the drawbar unit to a main controller, so the main controller detects the present position of the drawbar unit.



GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*